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Oxidative stability of krill oil (*Euphasia superba*)

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Krill oil has been reported in many studies to have high oxidative stability when evaluated by peroxide value (PV) and anisidine value (AV). However, recent studies have shown that other compounds than primary and secondary oxidation products are formed when krill oil is exposed to oxidative conditions. These compounds include Strecker degradation compounds and pyrroles. Some of these compounds may have antioxidative effect. Commercial scale processing of krill prior to extraction may affect the oxidative stability of krill oil. Therefore, the main objective of this study was to compare lipid oxidation in krill oil produced in a commercial process and krill oil carefully extracted from frozen krill in the laboratory. Krill oil was incubated at different temperatures (20, 30 and 40 °C) for 1, 2, 3, 4 and 6 weeks, under conditions of constant stirring while being exposed to air. The oxidative stability of both oils was assessed by simple chemical analyses such as PV, AV, spectrophotometric determination at 400 nm, and also advanced determination methods such as a) measurement of secondary volatile oxidation products and Strecker degradation products by DHS-GC/MS, b) measurement of lipid classes especially phosphatidylcholine and phosphatidylethanolamine, c) measurement of antioxidants level such as tocopherols, rosemary, ascorbyl palmitate and astaxanthin upon storage. In addition, the effect of residues or impurities present in krill oil contributing to its oxidative stability were investigated by d) the determination of amino acids composition and transition metals such as Cu²⁺ and Fe²⁺.